Concealed texting while driving: What are young people's beliefs about this risky behaviour?

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Making a conscious effort to hide the fact that one is texting while driving (i.e., concealed texting) is a deliberate and risky behaviour involving attention diverted from the road. As the most frequent users of text messaging services and mobile phones while driving, young people appear at heightened crash risk from engaging in this behaviour. First, several small focus group discussions (N = 12) were carried out to elicit the underlying salient beliefs regarding this behaviour, in accordance with the Theory of Planned Behaviour (TPB). Findings from these discussions, in conjunction with available prior evidence regarding general mobile phone use while driving, then informed questionnaire items that assessed young peoples' beliefs regarding this behaviour, as well as intention to engage in this behaviour in the next week. In the questionnaire phase of the study, participants (N = 171) were aged 17 to 25 years, owned a mobile phone, and held a current driver's licence. Results showed that there were significant differences between low and high intenders (to engage in concealed texting while driving) on the behavioural, normative, and control beliefs investigated. Specifically, high intenders were more likely to believe that concealed texting while driving would result in sharing information with others, using time effectively, and were less likely to think that free-flowing traffic would prevent their engagement in this behaviour. By targeting these beliefs, these findings may potentially inform the development of advertising and other public intervention strategies, aimed at ensuring young drivers reconsider their engagement in this risky behaviour.

Keywords: Theory of Planned Behaviour; mobile phone; texting, driving, beliefs

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1. Introduction

Mobile phone use (including both talking and texting) while driving has been associated with a two to fourfold increase in the chance of road crash (McEvoy et al., 2005; Svenson & Patten, 2005), largely due to diversion of attention away from the road and the primary task of driving. Despite this increased crash risk, a recent study by the National Roads and Motorists' Association (NRMA) Insurance found that 88% of NSW drivers continue to make calls while driving, and 68% send text messages (Campbell, 2012). Of particular concern is that younger drivers, aged 18 to 30 years, are most likely to engage in these risky behaviours (McEvoy et al., 2006). These statistics, combined with the fact that 17 to 25 year olds are represented in over 20% of road crash fatalities in Australia (Department of Infrastructure and Transport [DIT], 2012), yet constitute only 12.4% of the population (Australian Bureau of Statistics [ABS], 2011), provide a valid basis to investigate why 79% of 15 to 24 year olds continue to use a mobile phone while driving (Petroulias, 2011).

1.1. Texting while driving

Texting while driving is a particularly risky behaviour as it involves higher levels of cognitive distraction (e.g., reading and composing a text message), physical distraction (e.g., finding the phone), and visual distraction (e.g., eyes focusing inside the car) (Drews et al., 2009; Nemme & White, 2010; World Health Organisation [WHO], 2011). Individuals aged 15 to 24 year olds are the most prolific users of text messaging services and, therefore, appear to have a heightened crash risk (WHO, 2011). A simulated driving study at Monash University Accident Research Centre in Victoria, Australia, found that novice drivers aged between 18 and 21 years spent 400% more time looking away from the road when they were texting than when they were not texting (Hosking et al., 2006). Despite this distraction and regardless of the illegal nature of using a handheld mobile phone while driving in Australia, drivers continue to send and receive text messages.

It has been suggested by some that legal sanctions (i.e., texting while driving is illegal throughout all states and jurisdictions in Australia), rather than reduce the crash risk as intended, may actually increase crash risk as drivers consciously and deliberately attempt to conceal their phone use, making it even more hazardous to read and type text messages (American Academy of Paediatrics [AAP], 2012). Despite a growing body of literature on general mobile phone use while driving (i.e., referring to talking and texting as a homogenous behaviour), only minimal research to date has examined texting while driving and few, if any, researchers have carried out theoretically-driven investigations with explicit reference to

concealed texting while driving. However, a few recent studies (e.g., Nemme & White, 2010; Walsh et al., 2007) have found support for talking and texting as distinct behaviours (i.e, with different factors found to predict people's intentions to engage in such behaviours), suggesting it may be worthwhile to study them separately. A study of concealed texting as a discrete and particularly problematic form of texting behaviour requiring further diversion from the task of driving would build on this emerging idea that general mobile phone use while driving may comprise a number of distinct sub-behaviours. The current study offers further insight by focusing on the underlying beliefs regarding concealed texting while driving to identify what cognitions motivate young people's behaviour. The findings can then provide focal points for public education strategies and advertising campaigns aimed at persuading young drivers to adopt safer intentions and, ultimately, behaviours in relation to concealed texting while driving.

1.2. The theory of planned behaviour

The Theory of Planned Behaviour ([TPB], Ajzen, 1985) is a well-validated decision-making model that has been successfully utilised to predict people's intention across a range of human social behaviours (Armitage & Conner, 2001) including general mobile phone use while driving (e.g., Walsh et al., 2007; Walsh et al., 2008; White et al., 2010) and general texting (i.e., not defined explicitly as concealed or otherwise) while driving (e.g., Nemme & White, 2010). The model posits that attitude, subjective norm, and perceived behavioural control (PBC) together predict intention, which in turn is the best predictor of behaviour. Attitude is defined as how positively the behaviour is evaluated, subjective norm is the perceived social pressure to perform or not perform the behaviour and comply with social standards, and PBC is the perceived ease or difficulty of performing the behaviour and can reflect past experience as well as consideration of obstacles (Ajzen, 1991). Relevant to the current study are the beliefs which underlie each of the TPB constructs of attitude, subjective norm, and PBC. The most readily accessible of these are known as salient beliefs (Ajzen, 1991). Behavioural beliefs, namely, the advantages and disadvantages of performing the behaviour influence attitudes; normative beliefs relating to the extent that individuals regard specific others as approving or disapproving of a particular behaviour underlie subjective norm; and control beliefs which are based on past experience and the perceived ability to perform the behaviour, in terms of barriers and facilitators, influence PBC.

A major strength of the TPB is that it can provide a framework for changing behaviour as well as predicting behaviour (Fishbein, 1997). Understanding what motivates a behaviour, through an understanding of the salient beliefs underpinning a behaviour (Warner & Arberg,

2008), may provide vital information for the development of countermeasures (Fishbein, 1997). In particular, analysing the belief-based measures for various subsets of the sample, for instance, low intenders versus high intenders, to engage in a particular behaviour, identifies whether significant differences exist in the influences of a specific behaviour for these different groups. It may be beneficial, therefore, to investigate underlying beliefs when investigating prevalent and risky behaviours, such as concealed texting while driving, as the development of advertising and public education countermeasures based on challenging these underlying beliefs may reduce the prevalence of this behaviour and, ultimately, save lives.

Most studies investigating mobile phone use while driving have tended to focus on the direct TPB measures (i.e., attitude, subjective norm, and PBC), as opposed to exploring the underlying beliefs. Some studies investigating other road safety issues, such as speeding, have explored underlying beliefs and found significant differences between different sub-groups, such as intenders and non-intenders (Forward, 2009), and low and high intenders (Horvath et al., 2012). For mobile phone use in general (including talking and texting) while driving, White et al. (2012) found significant differences between frequent and infrequent users on some of the behavioural, normative, and control beliefs for the use of both hands-free and hand-held mobile phones. Specifically, frequent users of a hand-held phone (most relevant to the current study as texting requires the use of hands) perceived they were more likely, for example, to use time effectively and share information than infrequent users. In response to this finding, White et al. (2012) suggested that countermeasures may address these beliefs by focusing on the need for better time management and trip preparation prior to embarking on the journey, as opposed to focusing on the perceived benefits of being able to organise activities while driving. Frequent users also had a greater perception that important others would approve of them using a mobile phone while driving than infrequent users. It was suggested that public education strategies could focus on others' disapproval of this behaviour by, for example, referring to drivers who use their mobile phones while driving as irresponsible or, alternatively, by reinforcing approval for those who do not engage in this behaviour (White et al., 2012). Frequent users were less likely to perceive the risk of fines, risk of crashing, and heavy traffic, for example, as preventing them from engaging in this behaviour. Countermeasures could, therefore, focus on raising awareness of the risks associated with this behaviour by providing crash and fine statistics (White et al., 2012).

1.3. The current study

The current study formed one part of a larger study that utilised an extended TPB to investigate psychological predictors of intention to conceal texting while driving in young

people. Although there is a growing body of literature that utilises the TPB to investigate mobile phone use (in general) while driving, few, if any, studies have explored the phenomenon of concealed texting while driving, and, in particular, the beliefs underlying this behaviour. This study, therefore, addressed the gap in current evidence by investigating the underlying TPB beliefs associated with the intention to engage in concealed texting among young drivers, aged 17 to 25 years, and to determine whether low and high intenders differed significantly on any of these beliefs. Drawing on past research investigating underlying beliefs associated with intentions to use a mobile phone (in general) while driving, as well as the intention to speed, it was expected that high intenders to conceal texting while driving in the next week would believe that there would be more positive behavioural outcomes (behavioural beliefs), that significant others would be more likely to approve of this behaviour (normative beliefs), and that fewer factors would prevent them from engaging in this behaviour (control beliefs).

2. Method

2.1. Phase 1 – belief elicitation

The initial phase of this study involved a number of focus groups to elicit underlying behavioural, normative, and control beliefs regarding the behaviour of concealed texting while driving. Phase 1 was also used to identify a definition of 'concealed texting while driving'. Information gathered in this phase then informed the items in the questionnaire in Phase 2 of the study.

2.1.2. Participants

Participants (11 females, 1 male) aged 17 to 22 years (*Mdn* = 19) were first-year psychology students recruited via an online recruitment system at a large Australian university. According to the participation criteria, they owned a mobile phone, had a current driver's licence, and resided in Queensland. They received course credit for their participation. To prevent potential bias, participants in this study were ineligible to participate in the subsequent questionnaire phase.

2.1.3. Materials/measures.

The preliminary focus group questions determined an operational definition of the phrase, 'concealed texting while driving' (e.g., "How would you define concealed mobile phone use?"). The subsequent questions were adapted from the standard TPB underlying salient belief elicitation questions (Fishbein & Ajzen, 2009). They identified accessible underlying behavioural beliefs (e.g., "What do you think would be the advantages of concealing your mobile phone use while driving?", "What do you think would be the

disadvantages of concealing your mobile phone use while driving?), underlying normative beliefs (e.g., "Consider the people important to you, who are they and would they approve of this behaviour?", " Would there be anyone who would disapprove of it?"), and control beliefs (e.g., "What factors may encourage this behaviour?", "What factors may discourage this behaviour?").

2.1.4. Procedure.

Prior to commencement of the study, ethics approval was obtained from the University's Human Research Ethics Committee. Participants were provided with an information sheet that described the project, including what participation involved, expected benefits and risks, and confidentiality. The duration of the focus groups was approximately 40 minutes and involved a guided discussion by the researcher. Responses were audio taped and transcribed, excluding any names or identifying information, thus maintaining participant anonymity. Consent was obtained verbally prior to commencement.

2.1.5. Results.

From the focus group discussions, the target behaviour of concealed texting while driving was defined as "making a conscious effort to hide the fact that you are texting while driving (e.g., by hiding your phone below the window or steering wheel). In doing so, it is not obvious to people outside your vehicle that you are texting". A content analysis then identified the most salient beliefs regarding this behaviour (see Table 1). The analysis revealed, for example, that most participants believed that concealed texting while driving would result in avoiding police apprehension and being distracted from driving (i.e., behavioural beliefs). Participants believed that peers were more likely to approve of this behaviour, whereas parents, for example, would not approve (i.e., normative beliefs). A phone with a keypad (as opposed to a touchscreen) increased the amount of control the participants felt they had over this behaviour; however, police presence, for example, reduced the amount of control perceived by the participants (i.e., control beliefs).

2.2. Phase 2 - Questionnaire

Of relevance to the current study, the questionnaire assessed participants' behavioural, normative, and control beliefs regarding concealed texting while driving, intention to engage in this behaviour in the next week as well as various demographic variables (e.g., gender, age, highest level of education attained). The questionnaire was piloted[1] on five young drivers to

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[1] There were five participants in the pilot study who were recruited from the researcher's contacts

Table 1

Summary of Most Salient Beliefs from Focus Group Discussions

Behavioural Beliefs		
	Advantages	• Avoiding police apprehension • Not being judged by others • Always being contactable
	Disadvantages	• Being distracted from driving/reduced concentration on the road • Increased crash risk • Engaging in an illegal behaviour • Making texting errors
Normative Beliefs		
	Who would approve? Who would disapprove?	• Peers • Parents • Family members • Police • Older people • Your passengers
Control Beliefs		
	What would encourage this behaviour?	• Type of mobile phone (i.e., keypad, not touchscreen) • Being stopped at traffic lights
	What would discourage this behaviour?	• Difficult road conditions • Police presence • Night driving • Awareness of crash risk

check for wording and time taken to complete. Return of a completed questionnaire was considered provision of consent to participate.

2.2.1. Participants.

Participants (n = 171, 126 females, 37 males, 8 unreported) were mainly first year psychology students (n = 110) recruited at lectures or self-selected via an online recruitment system at a large Australian university. Additional participants (n = 61) were recruited from

other faculties on the campus grounds and from a snowballing of the researcher's family and friends. All participants were aged between 17 and 25 years (M = 20, *Mode* = 18, SD = 2.4), 79.5% owned a touchscreen phone (10.5% owned a phone with a keypad), 84.2% had an open or provisional licence, and 60.2% had completed high school as their highest level of education. On average, the participants reported driving 6.9 hours per week (SD = 4.9) in either an automatic (52.6%) or a manual car (42.1%). Most participants had the option of either completing the online (n = 83) or hard copy (n = 88) version of the questionnaire.

2.2.2. Materials/measures.

The questionnaire was based on the standard TPB self-report format (Fishbein & Ajzen, 2009). As outlined in Fishbein and Ajzen (2009), the questions were framed in terms of reference to the target behaviour, action, context, and time. Thus, the target behaviour was "texting in a concealed manner while driving in the next week". All belief items were each measured on a seven-point likert scale, ranging from (1) *extremely unlikely* to (7) *extremely likely*. Scales were not created as some items were positively worded and some were negatively worded and the purpose of the analysis was to determine which individual belief items, if any, differed significantly beltween low and high intenders.

Behavioural beliefs. Six behavioural beliefs (e.g., sharing information with others, using time effectively) were measured on the question stem of "How likely is it that texting in a concealed manner while driving in the next week would result in the following?"

Normative beliefs. For normative beliefs, participants responded in relation to six salient referent groups (e.g., parents, police) and on the question stem of "How likely is it that the following individuals or groups of people would approve of you texting in a concealed manner while driving in the next week?"

Control beliefs. Control beliefs were assessed for four situations (e.g., difficult road conditions, type of phone) and on the question stem of "How likely are the following factors to prevent you from texting in a concealed manner while driving in the next week?"

Intention. Three items measured intention (i.e., "I intend to text in a concealed manner while driving in the next week", 'It is likely that I will text in a concealed manner while driving in the next week', and 'I am willing to text in a concealed manner while driving in the next week') and formed a reliable scale (Cronbach's α = .90).

3. Results

3.1. Data pre-checks

Pre-checks were conducted to determine whether any significant differences existed between participants who completed the hard and online versions of the questionnaire in

relation to a range of demographic characteristics. The results of chi-square analyses for gender, $\chi^2(1) = 0.01$, $p = .925$, and car type, $\chi^2(1) = 0.50$, $p = .481$ were not significant, indicating no differences between the two groups. Similarly, there was not a significant difference in intention between these two subgroups, $t(167) = 0.60$, $p = .551$ and, therefore, the two subgroups were compiled into the one sample for the analyses.

3.2. Descriptive analysis

Table 2 describes how often participants reported engaging in concealed mobile phone use while driving. For example, 50.9% of participants reported sending a text message in a concealed manner at least 1 to 2 times per week and 60.8% reported reading a text message in a concealed manner while driving at least 1 to 2 times per week. In comparison, 39.2% of participants reported making a phone call in a concealed manner while driving at least 1 to 2 times per week, and 45% reported answering a phone call in a concealed manner while driving at least 1 to 2 times per week, showing concealed texting while driving to be a more common behaviour than talking on the phone in a concealed manner while driving in this sample of young drivers.

3.3. Differences in beliefs between low and high intenders.

Three separate repeated measures MANOVAs explored whether there were any significant differences between low and high intenders for behavioural, normative, and

Table 2

Reported Frequencies (%) of General Mobile Phone Use (Including Talking and Texting)

How often do you do the following in a concealed manner while driving:	More than once per day	Daily	1 – 2 times per week	1 – 2 times per month	1 – 2 times per 6 months	Once a year	Never
Use a mobile phone for any purpose?	9.9%	22.2%	29.2%	10.5%	8.2%	3.5%	16.4%
Send a text message?	9.4%	14.6%	26.9%	11.1%	7.6%	1.8%	28.7%
Read a text message?	11.1%	21.6%	28.1%	9.9%	4.7%	5.3%	19.3%
Make a phone call?	7.6%	12.9%	18.7%	17.0%	10.5%	0.6%	32.7%
Answer a phone call?	8.8%	14.0%	22.2%	14.0%	9.4%	4.7%	26.9%

control beliefs. Participants were divided into low and high intenders (the independent variable) split at the mid-point of the intention scale (i.e., 3.5 on the 7-point scale) which generated a categorical variable of high intenders (n = 81) with a score of over 3.5 and low intenders (n = 85) with a score of below 3.5. Overall, significant multivariate effects were found between low and high intenders in relation to behavioural beliefs, Wilks's $\Lambda = .78$, $F(7,158) = 6.57$, $p < .01$, partial $\eta^2 = .23$; normative beliefs, Wilks's $\Lambda = .93$, $F(6,160) = 2.23$, $p = .043$, partial $\eta^2 = .08$; and control beliefs, Wilks's $\Lambda = .92$, $F(4,163) = 3.53$, $p = .009$, partial $\eta^2 = .08$.

Table 3 shows the results of the univariate tests. These tests, interpreted with Bonferroni adjustments, showed significant results for the behavioural belief items 'sharing information with others', $F(1,164) = 21.90$, $p < .07$, $\eta^2 = .19$, and 'using time effectively', $F(1,164) = 29.68$, $p < .007$, partial $\eta^2 = .15$. Inspection of the mean scores indicated that high intenders were more likely to believe that concealed texting while driving would result in sharing information with others and using time effectively than low intenders. A significant result was also found for the control belief item of 'free-flowing traffic', $F(1,166) = 7.16$, $p = .008$, partial $\eta^2 = .04$. Mean scores indicated that free flowing traffic was less likely to prevent high intenders from concealed texting while driving than low intenders. For normative beliefs, none of the individual items were significant at the univariate level.

4. Discussion

This study addressed a significant gap in current evidence by investigating explicitly the phenomenon of concealed texting while driving. Few, if any, studies have investigated this behaviour, and by exploring the underlying TPB beliefs associated with it, the current study was able to identify motivations that may be challenged through public education campaigns. The hypothesis that low and high intenders to engage in concealed texting while driving would differ significantly on their underlying beliefs, was supported. Specifically, the expectations that high intenders would be more likely to support the positive behavioural outcomes (behavioural beliefs), more likely to believe that significant others would approve of this behaviour (normative beliefs), and less likely to support the idea that certain factors would prevent them from engaging in this behaviour (control beliefs) than low intenders, were supported. Although it is difficult to draw comparisons with previous studies, as

Table 3

Comparison of Low and High Intenders on Behavioural, Normative, and Control Beliefs

Dependent Variable	Low Intenders *M* (*SD*)	High Intenders *M* (*SD*)	*F*	Sig.	Partial η^2
Behavioural Beliefs: How likely is it that texting in a concealed manner while driving in the next week will result in the following-					
Sharing information with others?	4.11 (1.20)	5.33 (1.31)	21.90	.000**	.12
Avoiding police apprehension?	3.74 (2.05)	4.21 (1.92)	2.31	.130	.01
Avoiding a fine?	3.71 (2.08)	4.21 (1.99)	2.54	.113	.02
Using time effectively?	3.61 (1.74)	4.98 (1.47)	29.67	.000**	.15
Being distracted from driving?	5.78 (1.66)	5.58 (1.25)	0.74	.393	.00
Being involved in a crash?	4.92 (1.67)	4.57 (1.48)	2.03	.156	.01
Making text errors?	5.32 (1.67)	5.54 (1.51)	0.83	.363	.01
Normative Beliefs: How likely is it that the following individuals or groups of people would approve of your texting in a concealed manner while driving in the next week-					
Friends/Peers?	4.03 (1.85)	4.70 (1.76)	5.73	.018	.03
Boyfriend/Girlfriend/Partner?	4.33 (2.53)	4.62 (2.40)	0.58	.446	.00
Parents?	1.85 (1.68)	1.84 (1.24)	0.00	.968	.00
Other family members?	2.21 (1.77)	2.78 (1.78)	4.28	.040	.03
Police?	1.37 (1.42)	1.11 (0.71)	2.21	.139	.01
Other drivers?	2.26 (1.68)	2.22 (1.21)	0.02	.883	.00
Control Beliefs: How likely is it that the following factors would prevent you from texting in a concealed manner while driving in the next week-					
Difficult road conditions?	6.51 (1.21)	6.34 (1.21)	0.83	.362	.01
Police presence?	6.69 (1.17)	6.76 (1.01)	0.71	.680	.00
Type of phone?	1.85 (1.68)	4.06 (1.76)	4.67	.032	.03
Free-flowing traffic?	5.00 (2.07)	4.12 (2.19)	7.16	.008*	.04

Note. *M* = Mean; *SD* = Standard deviation.

* $p < .013$ (Bonferroni-adjusted alpha level for control belief items). ** $p < .007$ (Bonferroni-adjusted alpha level for behavioural belief items).

concealed texting while driving is likely to be a unique behaviour with its own underlying beliefs, the results are consistent with previous research investigating the underlying beliefs for general use (i.e., talking and texting) of both hands-free and hand-held mobile phones (White et al., 2012), and speeding intentions (Horvath et al., 2012) in that high and low intenders significantly differed on a range of beliefs, as theoretically expected. For the individual belief items, some key influences were identified that differentiated low and high intenders on the individual behavioural and control beliefs items.

4.1. Behavioural beliefs

Significant differences were found for two of the individual behavioural beliefs. High intenders were more likely to see 'sharing information' and 'using time effectively' as positive outcomes of concealed texting while driving than low intenders. For 'sharing information', public advertising campaigns could target this perception by suggesting, for example, that drivers may no longer be able to share information if their concealed texting led to a crash or fatality. Although fear-based campaigns have been widely used in Australia particularly when addressing public health issues, research has shown that male drivers are less influenced by fear-based advertising approaches than females (Lewis, Tay et al., 2007; Lewis et al., 2008). In response to this evidence, it has been suggested that campaigns evoking positive affect (e.g., humour) may be an effective alternative (Lewis, Watson et al., 2007, Lewis et al., 2008). Based on the current study, advertising campaigns could focus on the possibility that, without complete attention, humorous errors can occur when a driver hurriedly types out a message. For example, a group of young drivers at the pub may gently rib their friend, who accidentally texted 'love you' to a mate; or a young female driver who accidentally texted a complaint she has about her boyfriend, intended for her best friend, to her boyfriend. Alternatively, a positive scene depicting young people at a barbeque or a picnic may reinforce the value of sharing information in person, and communicating face to face, as opposed to via a text message especially when typed, sent, and/or read while driving. The aforementioned concepts (similar to others suggested in subsequent sections of this paper) would require further empirical investigation to determine their perceived effectiveness but, they do draw on the evidence derived from this current study and related evidence from the road safety advertising context.

For 'using time effectively', it may be meaningful to challenge the misperception that time spent driving safely is considered wasted time and the associated notion that one should make time up on the road (Hole, 2007). This idea could be achieved by reinforcing the importance of safe driving and reminding drivers that their passengers are relying on them.

Without complete attention, texting errors can occur, requiring additional time to correct them. Similarly, wrong turns resulting from driver attention diverted to their mobile phone, can mean it takes longer to reach their destination. Previous studies have suggested that a focus on better time management and trip preparation prior to embarking on the journey, as opposed to focusing on the perceived benefits of being able to organise activities while driving, may also challenge the belief that concealed texting while driving means the driver is using their time effectively (White et al., 2012).

4.2 Normative beliefs

None of the normative beliefs differed significantly between low and high intenders. However, there was the perception of general disapproval from most referents, in particular 'parents' (low intenders $M = 1.85$; high intenders $M = 1.84$) and 'police' (low intenders $M = 1.37$; high intenders $M = 1.11$). The mean scores indicated that low and high intenders believed these two reference groups were 'extremely unlikely' or 'quite unlikely' to approve of concealed texting while driving. Only 'friends/peers' and 'boyfriend/girlfriend/partner' referent groups were perceived as likely to approve of this behaviour, however inspection of the mean scores indicated the level of perceived approval was quite low (i.e., for 'friends/peers', low intenders $M = 4.03$; high intenders $M = 4.70$; for 'boyfriend/girlfriend/partner', low intenders $M = 4.33$; high intenders $M = 4.62$).

Generally speaking, normative influences can be complicated to determine. They underlie subjective norm, a direct TPB construct, which studies have shown to be a weaker predictor of intention than attitude and PBC (Ajzen, 1991). It has therefore been suggested that other normative influences may need to be considered (Ajzen, 1991). One such alternative influence that may be relevant to the current study is moral norm. As concealed texting while driving is an illegal behaviour, it follows that people's intention to engage in, and actual engagement in this behaviour, may involve moral considerations (Ajzen, 1991; Armitage & Conner, 2001; Conner & Armitage, 1998). In support of this suggestion, Nemme and White (2010) found moral norm to be a significant predictor of sending and receiving texts (in general) while driving. Future research should investigate this construct for concealed texting while driving.

4.3. Control beliefs

The current study found one control belief differed significantly between low and high intenders. High intenders were less likely to perceive that 'free flowing traffic' would prevent them from concealed texting while driving than low intenders. Advertising countermeasures could emphasise the importance of drivers being responsible for paying

constant attention to the road regardless of traffic conditions, as it is difficult to predict the behaviour of other drivers and pedestrians. As an humorous alternative, interventions may challenge the driver's perception that they are still completely in control when they are concealing their texting while driving. Perhaps this could be depicted in an advertisement showing a car with a young driver who is texting, swerve onto the footpath, knock down a row of full garbage bins, and end up in a pool, sitting soaked on the side of a submerged car.

4.4.Strengths and limitations

This study was, to our knowledge, the first investigation of the underlying beliefs regarding concealed texting while driving. The underlying beliefs identified provided insight into some key influences underpinning the standard TPB constructs (i.e., attitude, subjective norm, and PBC) which could potentially be challenged by interventions designed to bring about behaviour change. The study's focus on young drivers who have a high crash risk (DIT, 2012) and are the highest users of text messaging services (WHO, 2011) reinforce the study's high degree of practical applicability. Efforts were made to recruit participants from beyond the first year psychology pool, potentially increasing the study's generalisability. Limitations include the use of self-report measures for an illegal behaviour which may have caused some participants to respond according to social desirability (Beck and Ajzen, 1991). However, in terms of admitting to engagement in the behaviour, it is noted that 59% did admit to engaging in the behaviour in the past week, suggesting that the confidential nature of the study may have mitigated the effect of social desirability. Future studies should include more males as the sample in this study was 78% female, potentially limiting the study's generalisability.

4.5. Future research

As this is the first study to examine concealed texting while driving, future research should continue to investigate this phenomenon as it represents a major road safety issue. An investigation of the underlying beliefs about concealed talking on a mobile phone while driving, as a comparison to concealed texting while driving, would be worthwhile to determine if it is a distinct behaviour with unique underlying beliefs. Finally, future research could develop and test these example advertising messages discussed in the present study, or focus efforts on the reported key influences of this behaviour.

5. Conclusion

This study provides an initial investigation of the underlying beliefs regarding concealed texting while driving, a pervasive road safety issue, particularly among young drivers. By exploring underlying beliefs this study was able to investigate a different aspect of this

phenomenon than similar studies utilising the TPB model to investigate mobile phone use (including texting) while driving. Studies such as this are paramount if our understanding of this potentially life-threatening activity is to be advanced, driver behaviour is to be changed, and ultimately lives are to be saved. Although more research needs to be undertaken to consolidate and extend on the findings of this study, these results have the potential to inform public education and advertising strategies that challenge young drivers' underlying beliefs and potentially make them reconsider deliberately engaging in this risky driving behaviour.

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